merely extending its scope. He added a deep interest in the aborigines to his earlier pursuits, and wrote, among other works, valuable memoirs on the dingo and on the sculpturing of sacred trees.

Etheridge was always absorbed in his science, and shunned ordinary social life, so that his real good nature could be appreciated only by a very small circle of intimate friends. His scientific worth, however, was widely acknowledged, and he received the Wollaston Fund from the Geological Society of London in 1877, the Clarke medal from the Royal Society of New South Wales in 1895, and the Mueller medal from the Australasian Association in 1911. His name is also associated with the Etheridge goldfield in North Queensland, a high peak on the Kosciusko tableland, and a glacier in Antarctica.

A. S. W.

NOTES.

THE report of observations of a gigantic dinosaurian reptile in the Congo region of Africa, which was made the subject of sensational articles in December last, proves, as we surmised (NATURE, December 18, p. 396), to be without foundation. Mr. Wentworth D. Gray, Acting Representative of the Smithsonian African Expedition in the Katanga, writing from Elisabethville on January 21 to the *Times* of February 23, says:—"I am authorised to contradict the statement that the members of the Smithsonian African Expedition who proceeded to this territory came here to hunt the Brontosaurus. There is no foundation for this statement. I may also state that the report of the Brontosaurus arose from a piece of practical joking in the first instance, and, as regards the prospector 'Gapelle,' this gentleman does not exist except in the imagination of a second practical joker, who ingeniously coined the name from that of Mr. L. Le Page."

THE first meeting since 1914 of the International Council for the Exploration of the Sea will be held in London on March 2. Delegates will be present from Belgium, Denmark, France, Finland, Holland, Norway, and Sweden. Russia and Germany are not represented, and France sends delegates for the first time. The German investigations, it is now known, have been resumed, and the steamer *Poseidon* has been working at sea since last September. The council, it is expected, will consider arrangements for the resumption of the pre-war investigations, and will devote special attention to tracing the effects of the restrictions on fishing during the war period on the abundance of fish in the North Sea. Proposals for the closing of certain North Sea areas against steam-trawling are, it is understood, to be considered. Arrangements are being made by the British Fishery Departments for an early beginning of an extended programme of research. The question of the inclusion of Germany has not yet been considered, but it is believed that there is a growing feeling in this country that she should be invited to participate.

THE Home Secretary, Mr. Shortt, announced in the House of Commons on February 24 that it is proposed that summer time shall begin on March 28 and end on September 27.

WE regret to announce the death, at seventy-five years of age, of Prof. J. Emerson Reynolds, F.R.S., professor of chemistry and chemical philosophy in Dublin University from 1875 to 1903.

MR. J. S. DUNKERLEY, of the University of Glasgow, and Mrs. E. W. Sexton, of Plymouth, have been appointed Ray Lankester investigators at the Marine Biological Laboratory, Plymouth.

THE lecture entitled "Some War-time Efforts in Chemical Industry at Gretna," arranged to be given by Mr. J. C. Burnham before the fellows of the Chemical Society on March 4, has been unavoidably postponed. The usual ordinary scientific meeting for the reading and discussion of papers will be held on that day.

AT the meeting of the Chemical Society held on Thursday, February 19, it was stated that the following changes in officers and council had been proposed by the council:—As secretary, Dr. H. R. Le Sueur *vice* Prof. S. Smiles. As vice-presidents, Prof. J. B. Cohen and Prof. S. Smiles *vice* Prof. A. Smithells and Prof. S. Young. As new ordinary members of council, Prof. A. J. Allmand, Dr. E. F. Armstrong, Mr. F. H. Carr, and Dr. J. T. Hewitt.

A DEPARTMENTAL Committee has been appointed by Dr. Addison to consider the present state of the law with regard to the pollution of the air by smoke and other noxious vapours, and to advise what steps are desirable and practicable to diminish the evils still arising from such pollution. The members of the Committee are:—Lord Newton (chairman), Capt. Hamilton Benn, Prof. J. B. Cohen, Mr. S. Curphey, Sir John Lithiby, Mr. J. F. MacCabe, Mrs. Gilbert Samuel, Mr. E. D. Simon, Bailie W. B. Smith, and Mr. F. J. Willis. Mr. E. C. H. Salmon, of the Ministry of Health, will be secretary, and any communication should be addressed to him at the Ministry, Whitehall, S.W.1.

THE officers and council of the Physical Society elected at the annual meeting on February 13 are as follows:—*President:* Prof. W. H. Bragg. *Vice-Presidents:* Dr. H. S. Allen, Prof. W. Eccles, Prof. A. S. Eddington, and Dr. R. S. Willows. *Secretaries:* Dr. D. Owen (Birkbeck College, Bream's Buildings, London, E.C.4) and Mr. F. E. Smith (National Physical Laboratory, Teddington). *Foreign Secretary:* Sir Arthur Schuster. *Treasurer:* Mr. W. R. Cooper (82 Victoria Street, S.W.1). *Librarian:* Dr. A. O. Rankine (Imperial College of Science and Technology). *Other Members of Council:* Mr. C. R. Darling, Prof. C. L. Fortescue, Dr. E. Griffiths, Dr. E. H. Rayner, Dr. A. Russell, Sir Ernest Rutherford, Dr. G. F. C. Searle, Mr. T. Smith, Dr. J. H. Vincent, and Mr. F. J. W. Whipple.

The *Morning Post* of February 17 contained an article from its correspondent in Paris stating that three days previously he had witnessed five experiments at a works in the northern suburbs of the city, each of which involved the production of a ton and a half of "high-class steel." At the present time such steel is made either in crucibles or in an electric or an open-hearth furnace. The novelty of the experiments referred to consists in the fact that the steels are made in some form of "converter" of the Bessemer type. Usually this process does not give a sufficiently scientific control of the product to enable high-class steels to be made. It appears from the account given that certain "secret substances" are added which have the effect of controlling the quality of the metal produced, so that it can be used as a basis for the manufacture of high-grade alloy steels. The process is said to have been worked out by four inventors, two of whom are Belgians. The demonstration was witnessed by about a dozen metallurgical experts, who were engaged in taking samples for tests. If the claims of the inventors are substantiated the process will be one of considerable practical importance, and further details will be awaited with interest. It is stated that they have decided not to patent their method, but to operate it as a secret process.

News has just been received of the death at Cairo of Mr. Henry Gribble Turner at the age of seventy-seven years. Mr. Turner joined the Madras Civil Service in 1864, and soon gained a reputation by his successful management of the wild tribes of Vizagapatam district on the east coat, a region where the practice of human sacrifice in honour of the Earth goddess had recently been discontinued. After holding for a time the office of Postmaster-General, he returned to his old district, Vizagapatam, which he administered with much credit until his retirement in 1889. It was due to Mr. Turner that, in the face of great opposition, the standard-gauge railway linking Calcutta with Madras was constructed. He was a skilled mineralogist, and discovered the Vizagapatam manganese deposits, the trade in which has so rapidly developed that the total export is now 600,000 tons annually. He also started the export of Indian magnesite, which proved most useful during the war. Another of Mr. Turner's projects was a harbour at Vizagapatam to serve the rich uplands of the interior, a scheme which is now at last to be undertaken. He failed to secure election as Member for South Somerset in 1895, and he thus escaped the fate of more than one distinguished Indian administrator who did not succeed in making his mark in the House of Commons.

The committee of the Sheffield Museums and Mappin Art Gallery has issued a consolidated report for the last five years. Special attention is directed to an exhibition relating to infant welfare which was held in 1916. The exhibits were of a comprehensive character, and a series of descriptions was prepared by Dr. Scurfield, Medical Officer, and Dr. Lucy Naish, which is now republished. The instructions in all questions relating to the care of children are elaborate and arranged with full knowledge and much common sense. The authorities of other provincial museums might consider the advisability of reprinting the pamphlet, which is likely to be of much utility.

In the February issue of *Man* Mr. A. C. Breton describes a remarkable picture-map from Mexico in the manuscript department of the British Museum. The museum authorities acquired the map from Mr. H. Stevens, who, in his turn, purchased it from the original finder, Col. Campos. It was found on the site of the ancient Indian city of Metlaltoynca, in a stone chest which appears to have formed the pedestal of an idol. Several remarkable statues have been found on this site, and the building depicted in the centre of the map is somewhat like the existing Castillo, a pyramid on a base with six high steps and a platform, on the summit of which are buildings. The interpretation of the figure-groups in the map is still to some degree uncertain, but its publication will doubtless lead to an elucidation of its meaning.

The identification of two statues in the Indian Museum, Calcutta, found at Patna about a century ago, has aroused much interest among Indian archæologists. The question of the date of these statues and of the inscriptions engraved upon them is discussed in vol. v., part 4, of the Journal of the Bihar and Orissa Research Society. Dr. Vincent Smith, in one of the last articles that came from his pen, was disposed to believe that they are portraits of two kings who reigned in the fifth century B.C. This conclusion, if it be correct, revolutionises the current view of the development of Indian art, because hitherto it has been supposed that stone sculpture began in the time of Asoka, who reigned some two centuries later than the assumed date of the Patna statues. Moreover, the execution of these presupposes a long prior development of plastic art. But it must be remembered that the dates of the statues are not yet quite certain, and the question is still under discussion by archæologists.

In *Sudan Notes and Records* (vol. ii., No. 4, October, 1919) Prof. G. A. Reisner announces the discovery for the first time in the Nile Valley of a horse cemetery. The graves were in four rows, and four complete skeletons were discovered, the horses being of a short, small breed, not unlike the Arab. Each horse was buried with its chariot trappings—they were not ridden at that period—and placed upright with the head towards the south. The regular spacing of the graves, the division into rows, the chronological order of the rows, and the uniformity of the graves in each row justify the conclusion that these horses were sacrificed at the funerals of the kings in order that the spirits of the horses might accompany the spirits of the kings into the other world. The idea is widespread, but in this special form it was hitherto unknown in Egypt. But excavations recently made at Kerma show that the sacrifice of men and animals at funerals was a well-established ancient Ethiopian custom. In fact, there seems reason to believe that horse-sacrifice was due to King Piankhy, who was a great connoisseur of horses, as is proved from his inscriptions.

PROF. C. E. A. WINSLOW, in an address to the American Association for the Advancement of Science entitled "The Untilled Fields of Public Health," expressed the opinion that the public health campaign of the future would need the collaboration of at least the seven following types of highly qualified experts: the physician, the nurse, the bacteriologist, the epidemiologist, the engineer, the statistician, and the social worker. In addition, there must be inspectors to supervise sanitary and housing conditions, and, finally, the administrator who organises and develops the work of all the rest. The latter ought to be medically trained, with subsequent specialisation in public health (*Science,* January 9, p. 23).

THE February number (vol. i., No. 5) of *Medical Science: Abstracts and Reviews*, published for the Medical Research Committee, has reached us. Reviews of current work on medical subjects appear monthly, diseases of the respiratory system and cardiovascular diseases, among others, being dealt with in this issue. In the article on the former, reference is made to the question of the production of emphysema of the lungs (a condition of permanent distension with other changes) by the playing of wind-instruments, as is stated in many text-books. Of forty-six professional players examined, in only three was there slight evidence of emphysema, so that the commonly accepted view seems to be without foundation.

WE have received the quarterly report of the Research Defence Society, dated January, 1920, when the society completed its twelfth year of active work. The society was founded to make known the value and the necessity of experiments on animals, the restrictions imposed on them in this country under the Act of 1876, the nature and the purposes of the experiments which are being made, and the discoveries which have come by the help of the experimental method; also to bring about a better understanding between the few who make these experiments and the many who profit by them. The campaign has been carried out by the circulation of pamphlets, by articles in the Press, and by public lectures. The president of the society is Lord Lamington, and the hon. secretary Mr. Stephen Paget.

MAJOR-GEN. SIR W. LEISHMAN publishes in the *Lancet* of February 14 (p. 366) the results of protective inoculation against influenza in the Army at home during 1918–19. The vaccine consisted of a mixture of three micro-organisms, the influenza bacillus, streptococci, and pneumococci. Among the inoculated, numbering 15,624, the incidence per thousand was:—Of attack, 14·1; of pulmonary complications, 1·6; and of deaths, 0·12. Among the uninoculated, numbering 45,520, the figures were 47·3, 15·3, and 2·5 respectively. At least half of the vaccinated received one dose only, and not two doses as recommended, and the vaccine used at first was considerably "weaker" than that used later. Nevertheless, the figures are decidedly favourable to the value of vaccination, particularly as a preventive of mortality from influenza.

MR. E. E. LOWE, in the *Museums Journal* (vol. xix., No. 7), utters a timely word of warning to the curators and governing bodies of local museums in regard to the haste they are displaying to be taken over by the Board of Education, as recommended by the Adult Education Committee of the Ministry of Reconstruction. If this fate ever overtakes them they will have ample time for unavailing repentance. Mr. Lowe's arguments are stated with considerable ability and force, and his views on the functions of museums are eminently sound. The modern museum, he urges, should, among other things, be educational, but he points out that it would constitute a grave error of judgment, as well as a breach of trust, to hand over museums to the local education authorities.

FROM *California Fish and Game* (vol. vi., No. 1) we learn that extensive plant is being set up at Tropico, California, for the preparation of agar-agar on a commercial scale. Experiments have been carried out which seem to show that agar-agar of a quality much superior to the imported article can be produced from the seaweeds native to the coast of southern California. If this venture is successful, it will create a new industry for the United States. In the same issue a series of figures illustrating the growth of the young of the black sea-bass or jew-fish (*Stereolepis gigas*) is given. These furnish a very striking illustration of the "recapitulation" theory, and explain how it is that the fishermen were unaware of the connection between the gaily coloured fish of a few inches long, with enormous dorsal and ventral fins, and the unicoloured giant in which these fins are relatively extremely small.

THE very handsome volumes issued in 1916–18 by the Maryland Geological Survey have now become available in Europe. They are largely a memorial to the energy of the director, William Bullock Clark, who held office for twenty-five years, dying at too early an age in 1917, and whose obituary, with a portrait, appears in vol. x., which includes his latest educational work, "The Geography of Maryland." This is now published as an amplification of the treatise already used in the State schools. Part 2 of this volume deals with water-supply, and the somewhat massive style of publication—a heritage from the traditions of the United States Geological Survey—makes one wish that the geographical part could have been issued separately bound. Mr. Clark and his staff also contribute two fully illustrated volumes on "The Upper Cretaceous Deposits of Maryland." These occur mainly on the left bank of the Chesapeake Inlet, opposite Baltimore, and are specially noted for their dicotyledonous flora. The Maryland Geological Survey, in continuation of its series of county descriptions, which recall the ambitious scheme of the Ordnance Survey of Ireland in 1837, published in 1917 its memoir on Anne Arundel County; this is written by a number of specialists, so as to present the area south of Baltimore from a geographic point of view. The co-operation of the United States Geological Survey enables this finely illustrated work to be accompanied by four large folding maps on the scale of 1/62,500 (four times that of the 1/250,000 sheets), showing the topography and political divisions, the geology, the soils, and the forestry and commercial areas.

THE scientific portion of the *Central Zeitung für Optik und Meckanik* for January 1 contains the first of a series of articles by Prof. von Rohr on the principal points of optical systems and the graphical methods of determining images. The constructions given are those suitable for convex and concave systems of which the principal planes and foci are given. The industrial portion includes a reproduction of the new regulations under which optical workers of eight years' standing may attend shortened courses of instruction at the Government optical school at Jena and, after a qualifying examination, obtain the optician's diploma. A list of the optical and other instruments for which there is at present a demand in foreign countries is given. The wages paid to the various grades of workers in metal in the principal countries of the world form the subject of a further article. A list of the publications of the German Committee on Standards for Industry is provided, and the importance of the rapid adoption of the new standards throughout the country is emphasised. Coloured wall-charts have been prepared, so that the information may readily be placed before the eyes of designers, foremen, and workmen.

IN a paper in the *Chemical Age* of February 14 Dr. Stephen Miall plots the atomic weights of the elements against their atomic numbers, and shows that all the elements lie upon a series of parallel lines of three different slopes. The atomic weights may be represented as $bx+a$, where x is the atomic number, a a small integer ranging from 0 to 5, and b has the value 2 for the elements from helium to nickel, 2·5 from copper to tungsten, and 3 from osmium to uranium. The first term, which contributes to the chemical character, he terms "live-weight," and the second term, which is of no influence on the chemical character, "dead-weight." Similar regularities have been previously pointed out, and, indeed, since the atomic weights for the most part conform to integral values, some such relation as the above is necessarily true. But the diagrams have a value apart from their interpretation. They suggest a novel basis for classification, and arrange the elements on parallel lines for which a and b have the same values. They may be useful to those seeking for regularities in the nuclear structure rather than in the atomic shell. Hitherto chemists have been too exclusively obsessed with the study of chemical character to the neglect of the atomic weight—an independent variable, as the study of radio-active change has made quite clear. The atomic weights, however, as the author remarks, mean something. They furnish the only present clue to the structure of the nucleus.

THE Carnegie Institution of Washington has issued another section of its monumental "Index of Economic Material in Documents of the States of the United States." The section, prepared by Adelaide R. Hasse, is the first instalment of the index relating to the State of Pennsylvania. Part i. contains the titles of collected documents, mainly printed by authority of the Senate and of the House of Representatives. Part ii. is a topical analysis arranged alphabetically from A to E. Among the longer sections we find Agriculture, Canals, Climate, Coals, Coal-mining, and Education. The period covered is from 1790 to 1904. The new volume has been preceded by twelve similar quarto volumes, and will be followed by others, each devoted to a single State. The index undertakes to deal only with the printed reports of administrative officers, legislative committees, and special commissions of the States, and also with Governors' messages. References are given by volume and page to all material of economic importance contained in the reports and messages indexed. Under each sub-heading the arrangement is chronological. In the alphabetical part the compiler has introduced, in addition to subject entries, the names of persons who have exercised an important influence on the development of the economic life of the State. After each name there is reference to work done. The amount of material which had to be examined for the preparation of this volume must have been very great.

A SHORT but useful list of books on ornithology and oology (No. 398) has just been circulated by Mr. F. Edwards, 83 High Street, Marylebone, W.1. It contains some two hundred and fifty items, including several long runs of serials such as the *Ibis*, Transactions and Journals of the Royal Microscopical Society of London, Proceedings of the Zoological Society of London, etc. The list is sent free on application.

OUR ASTRONOMICAL COLUMN.

HOLMES'S COMET.—Dr. Schorr reports that the cometary object 1919*f*, found on two plates taken at Bergedorf by Dr. Baade on December 10, is definitely not identical with Holmes's comet, as it failed to appear on two plates taken on December 26, on which it would have been registered if it were moving in accord with the ephemeris calculated for that comet.

MINOR PLANET GM.—This is the object discovered by Senor Comas Sola on January 13, and considered for a time to be a comet. As it is the brightest minor planet discovered in recent years, it is of interest to give the elements which have been deduced at the Berkeley Observatory, California.

$$T = 1920 \text{ March } 16{\cdot}36 \text{ G.M.T.}$$

$$\left.\begin{aligned}\omega &= 194^\circ\ 28'\\ \Omega &= 300^\circ\ \ 0'\\ i &= 17^\circ\ 59'\end{aligned}\right\}1920{\cdot}0$$

$$q = 2{\cdot}326$$

$$e = 0{\cdot}1109$$

$$\text{Period} = 4{\cdot}2315 \text{ years}$$

Ephemeris for Greenwich Midnight.

	R.A. h. m. s.	N. Decl. ° ′	Mag.
February 28 ...	7 25 26	17 33	11
March 7 ...	7 24 54	16 44	

NOVA IN LYRA.—Harvard Bulletin No. 705 reports the finding of another nova on the Harvard photographs by Miss Mackie. Position for 1900·0, R.A. 18h. 49m. 30s., N. decl. 29° 6·3′. Between December 4 and 6 it rose suddenly from mag. 16 or fainter to mag 6·5; on January 6 it had sunk to 8·5. Messrs. Adams and Joy report from Mount Wilson that its spectrum shows the striking nova characteristics.